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SOFTWARE SUPPORT PRACTICES

PREPARED FOR NCR CORPORATION

INPUT

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MARCH 26, 1984

SOFTWARE SUPPORT PRACTICES

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I INTRODUCTION

A. STUDY BACKGROUND

- NCR Corporation has recently combined hardware and software support within one organization. As part of the reorganization, NCR is reassessing its software support practices. It will reorient its practices based on:

  - NCR's own needs and plans; and

  - An informed assessment of competitor's practices and plans.

- As part of this assessment, NCR wished to learn more about the practices of other firms (both hardware manufacturers and independent software firms) that produce and support software used by MIS departments and other professional users.

- This study was prepared by INPUT as a custom study for the NCR Corporation.

B. ISSUES TO BE ADDRESSED

In the course of the study the following issues are addressed:

- What types of software licenses are offered? E.g.,

  - Lease for a specified term.

  - Monthly Payment.

  - Annual Payment.

  - Paid Up License.

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- Purchase.

- Are certain software products offered as a package with a fixed price for the total package?

• To what extent are software products offered with the price included in the hardware price?

• Which types of discounts or other financial incentives are available? E.g.,

- Volume.

- Multiple Sites.

- Multiple Systems at a site.

- Prepayment.

• To what extent do license, discount and other terms differ, depending on whether the customer is an end user or OEM (or other reseller)?

• Is software warranted?

- Under what conditions? E.g.,

    • With installation service.

    • Without installation service.

- For how long?

- What does the warranty cover?

• How is software support charged? E.g.,

- Part of license fee.

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- Separate, but required.

- Separate, but optional.

- How does the way in which support is charged for depend on the type of license?

- What are the types of support fee payments?

- What is the maintenance discount structure? Is it related to the software license discount? If there a discount for having a single customer contact point?

- Are hardware and software support available separately?

- How long may a user be covered by a maintenance contract after a new release/version is available if he does not upgrade to it?

    - How much notice is given for discontinuanace?

    - How is notification made?

    - Are some hardware models' software not supported at all?

- Are different levels of software support available?

    - What are differences? E.g.,

        - On-site assistance?

        - Different levels of response time?

        - Different levels of resolution time?

- Who determines problem severity?

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- What are severity categories?

● What is the relative amount of different user means of problem notification
E.g.,

  - Letter.

  - Electronic Mail.

  - Telephone.

    . 800 number? Multiple (why)?

    . Hours available?

● How are trouble reports responded to? E.g.,

  - On-Site Aid.

  - Phone (% call backs).

  - Letter.

  - Newsletter.

  - Next regular maintenance release.

  - Electronic message.

● How is the software support function organized? To what extent are there
specialists by:

  - Region?

  - Products?

  - Complexity?

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- Combinations?

● Do hardware and software support personnel work in teams? How much cross-training is there?

● How are problems/resolutions tracked?

 - What precent are resolved satisfactorily?

 - How is this figure audited?

● How are customers communicated with on a regular basis?

 - Media used and frequency?

 - Topics covered? E.g.,

   . Manual, Original and Updates.

   . On-site installation visist.

   . Phone calls.

   . Product Fixes.

   . Product Updates.

   . Newsletters, Bulletins.

   . Product usage techniques.

 - Cost.

● Are there limits on support?

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- Under what conditions is routine software support provided on the customer's site?

    - Special contracts?

    - Types of service? E.g.,

        . Education.

        . Initial installation.

        . Severe/complex failures.

- What types of special software support are provided that are not in the normal maintenance fee? E.g.,

    - Product modifications.

    - Application design.

    - Applications programming.

    - Systems software modification.

    - Operations support.

- What are the significant trends and changes expected in the software support area?

- To what extent do the issues differ depending on whether applications or systems software is involved?

C. METHODOLOGY

- INPUT prepared a draft questionnaire which was reviewed with NCR staff at a meeting in Dayton in December 1983 and in January by letters and telephone. A copy of the questionnaire is in Appendix A.

- Twenty-five representative hardware companies and independent software companies were interviewed by telephone in January-March 1984. The firms interviewed are shown in Exhibit I-1.

- In some cases, two individuals within a company were interviewed - a technical and a marketing person. The following "ground rules" were followed in the interview process:

  - NCR was not identified as the study's client.

  - Each respondent was assured that their company was not identified in any report.

  - As further incentive to participate, respondents were promised a summary of the study to help them plan their company's future activities. NCR will review any summary before it is released.

- An indirect finding of the study is that reponsiblity for software support policy and management varies widely from firm to firm.

  - While most firms and individuals were willing to take part in the survey, there was often uncertainty within a firm as to the proper area and person to take part.

  - It was not unusual to be passed from person to person on a chain (or sometimes a circle) over a period of weeks in an organization that had no objection in principle to taking part.

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EXHIBIT I-1: COMPANIES INTERVIEWED

HARDWARE COMPANIES

Amdahl

Burroughs

Control Data Corp.

Data General

Hewlett Packard

Honeywell

Prime

Sperry

Tandem

Wang

INDEPENDENT SOFTWARE COMPANIES

ADR

Anacomp

Arthur Andersen

BBN Communications

Cincom

Computer Associates

Cullinet

Informatics

Nixdorf Computer Software Co.

PMS

Peachtree Software (MSA)

Software AG

Software International

Systems Development Corp.

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- At least half the organization's interviewed had been interviewed for a somewhat similar study in mid-1982. Not only had virtually all of our previous respondents assumed new responsibilities, but their previous job often no longer existed.

- This conforms to other information available to us which indicates that software support organizations are in a state of flux. When (and if) they settle down, they will be able to focus on policy questions and this could have a significant impact on software support management and operations.

● Exhibit I-2 lists the different types of people interviewed (note: some titles, e.g. Vice President of Marketing, were held by multiple respondents in different companies).

- This indicates that there are widely different views on where essentially the same functional knowledge should reside within an organization.

● As mentioned earlier most companies were quite willing to be interviewed. Most respondents were obviously attracted by receiving a study summary to help them do their job better.

- While many respondents were fairly new to their jobs or this area, with very few exceptions all were quite knowledgeable. They took their jobs and the interview seriously.

- In one or two cases, a recent reorganization had made it difficult for INPUT (or the respondents) to organize all of the data and respondents needed. Needless to say, these respondents were most eager for a study summary. Two interviews had to be abandoned because we could not find knowledgeable respondents.

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Exhibit I-2: Representative Respondent Title

Vice President and Group Product Manager

Product Line Manager

Manager, Product Marketing

Partner and Division Head

Director, Software Systems and Sales

Client Revenue Program Manager

Vice President Marketing

Software Services Manager

Vice President Product Marketing and Support

Manager, Hardware/Software Services

Technical Support Manager

Vice President, Business and Product Planning

Director, Marketing

Product Support Manager

Director, Systems and Environmental Services

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Director, Systems Marketing

Director, Product Operations

Manager, Technical Operations

Technical Marketing Manager

Planning Analyst

Vice President, Corporate Development and Strategy

Director, Software Business Planning

- Parts of several questions (e.g., software royalty arrangements) touched on sensitive areas and many respondents would not answer because they felt this was proprietary.

D.   REPORT ORGANIZATION

- Chapter II contains the summary and analysis of survey responses. The information is contained on three levels:

  - Detailed Exhibits.

  - Summary Exhibits.

  - Narrative.

- Detailed exhibits show the responses of each company to each question.

  - Detailed exhibits are arranged in question order. (The question number and question topic are at the top of each page on the left.) A copy of the questionnaire is in Appendix A.

  - Respondents A - J are hardware companies and respondents K - Y are software companies. Since there appears to be no way of inferring company identification from respondent answers, the same letter refers to the same company throughout.

- Many of the more complex detailed exhibits have been summarized, contrasting the summarized data of hardware and software companies.

- The narrative ties together and interprets the data contained in both levels of exhibits.

- In addition, INPUT is providing NCR with a set of the actual questionnaire (with identities removed). These have the same alphabetic indentities as the detailed exhibits in this report.

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II   FINDINGS

A.   SOFTWARE PRODUCTS: BACKGROUND

- Software companies are likely to offer customers a slightly wider choice of software license types (1.9 choices per vendor) than are hardware companies (1.7 choices per company).

- Rental and purchase are the most common types of licenses offered by software companies, while paid-up licenses are by the far the most common type offered by hardware companies (Exhibit II-1).

  - Changes are planned in the emphasis between different license types by some vendors, however, there is little net change expected (Exhibit II-2).

  - The reasons given for making these changes generally involve changes in marketing strategy and a belief that revenues will be enhanced (Exhibit II-3.)

- Not surprisingly, 40% of hardware companies offer bundled hardware/software while only one out of eight software companies do (Exhibit II-4).

  - Of the companies offering bundled products, all but one offer the option of separate support.

  - Several software companies plan to move more into offering bundled products. Hardware company plans are mixed. In both groups, most companies are not planning significant changes.

- Software companies are more likely to offer a greater variety of discounts and other financial incentives (2.9 per vendor) than are hardware companies (2 per vendor).

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EXHIBIT II - 1: LICENSE TYPES OFFERED

TYPE OF LICENSE: PERCENT OF VENDORS

TYPE VENDOR	LEASE	RENTAL	ANNUAL	PAID-UP	PURCHASE
Hardware	30%	30%	20%	70%	20%
Software	33%	53%	13%	40%	47%
All	32%	44%	16%	52%	36%

Note: Rows total more than 100% because of multiple license types offered

Source: Exhibit II - 2

EXHIBIT II - 7: METHOD OF CHARGING FOR SOFTWARE SUPPORT

| TYPE VENDOR | IN LICENSE | SEPARATE CHARGE | |
		REQUIRED	OPTIONAL
Hardware	40%	30%	60%
Software	30%	27%	60%
All	36%	28%	60%

Note: Rows total more than 100% because of product differences

Source: Exhibit II - 8

EXHIBIT 11-6

4a.   Method of charging for software support.

VENDOR	PART OF SOFTWARE LICENSE	SEPARATE CHARGE		PERCENT EXERCISING OPTION
		REQUIRED	OPTIONAL	
A	Small products		X	15% (new)
B		X	X	
C			X	50%
D		For 3 months.	X	50%
E			X	90% systems software. 40% applications software.
F	X			
G			X	90%
H	X			
I			X	90%
J	X	X	Confidential.	Confidential.

EXHIBIT II-8.

4a. Method of charging for software support.

VENDOR	PART OF SOFTWARE LICENSE	SEPARATE CHARGE REQUIRED	SEPARATE CHARGE OPTIONAL	PERCENT EXERCISING OPTION
K			x	85 – 90
L			x	90
M			2 products x	100
N	per diem rate on all others		x	20 (new offering)
O	x	x	x	95
P				
Q	for 1 yr., then annual maint.fee			
R		fixed term	perpetual x	85
S			provide maint.as occurs on system purchase x	33
T			x	95
U	1) annual contract ** 2) T&M charge	x		
V				
W			x	100
X	any tailoring is charged.			

**depends on how product is sold.
could be part of product.

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EXHIBIT II-8

4a. Method of charging for software support.

VENDOR	PART OF SOFTWARE LICENSE	SEPARATE CHARGE		PERCENT EXERCISING OPTION
		REQUIRED	OPTIONAL	
Y	1% of sale price per month.			

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EXHIBIT II-2

1a. Sources of software license revenues.

VENDOR	LEASE		RENTAL		ANNUAL		PAID-UP		PURCHASE	
	1984	1987	1984	1987	1984	1987	1984	1987	1984	1987
A	X		X							
B	X	X					X			
C							100%	Less		
D							100%			
E	0%	10%	66%	70%	0%	0%	33	20%	0%	0%
F	0	0	60	40	40	60	0	0	0	0
G	X				X		X			
H							X			
I							X		X	
J									100%	

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EXHIBIT II-2

1a. Sources of software license revenues.

VENDOR	LEASE		RENTAL		ANNUAL		PAID-UP		PURCHASE	
	1984	1987	1984	1987	1984	1987	1984	1987	1984	1987
K	9%		1%						90%	
L			90%	50%			10%	50%		
M	x		x						Main	
N	100%									
O							100%			
P			2	10%			98%	88%		
Q									100%	
R	80%								20%	
S			x				x			
T			1%	50%					99%	50%
U					100%					
V	X		X		X		X		X	
W			65						100%	
X							100%			
Y										

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EXHIBIT 11-3

(SOFTWARE COMPANIES)

1. Reasons for change in sources of software license revenues.

	REASONS FOR	
	INCREASE	DECREASE
LEASE		
RENTAL	More tangible SW	
ANNUAL PAYMENT		
PAID-UP LICENSE	Clients more willing to pay up front	
PURCHASE	Change strategy and market. More attractive pricing	

EXHIBIT II-3

(HARDWARE COMPANIES)

1. Reasons for change in sources of software license revenues.

	REASONS FOR	
	INCREASE	DECREASE
LEASE	In transition – moving 95% bundled to unbundled SW and SW support. New policy proposed.	
RENTAL	New policy.	Customer trend.
ANNUAL PAYMENT	Customer trend	
PAID-UP LICENSE	Volatile SW environment (revenue protection).	More variety (some rental). New policy.
PURCHASE	Revenue protection.	

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EXHIBIT II-4

2. Hardware/software bundling.

VENDOR	BUNDLED?		SEPARATE SUPPORT		SIGNIFICANT CHANGE IN FUTURE?			
	YES	NO	YES	NO	YES	REASON	NO	REASON
A		X		X	X	Will offer different level of support to different level of customer. Separate SW support contract annually at warranty expiration.		
B	X							
C	X			X			X	
D		X					X	Move toward unbundling.
E		X					X	Firm policy to unbundling.
F		X					X	
G	X		X		X	Push ownersip of application to user; micro-mainframe links. -		
H		X			X	Only if we develop SW to recover all costs.		
I	X		X		X	Decrease HW cost. Increase SW cost.		
J	X		X				X	

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- Nearly all software companies offer volume and multiple site discounts. Many also offer discounts for multiple systems and bundled combinations of packages (Exhibit II-5).

- Hardware companies follow the same general pattern as software companies except that:

    . Fewer vendors are as likely to offer volume or bundled package discounts.

    . Multiple site discounts are relatively rare.

    . Prepayment discounts are considerably more common.

B. SOFTWARE SUPPORT PRICING

- The pattern of charging for software support is broadly the same in software and hardware companies (Exhibit II-7).

    - Over one-third of companies include the cost of support for at least some of their products in the license fee.

    - Almost one-third have a separate charge that is mandatory, i.e., the net effect is the same as if it were on the license fee.

    - Sixty percent have an optional support charge. The percent of customers exercising this appears to vary considerably (Exhibit II-8). However, about half of the respondents who supplied figures said that 90% or more of their customers exercised this option.

    - There were only two respondents who said that the means of charging for support was dependent on the manner in which the software was acquired.

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EXHIBIT II - 5: DISCOUNTS AND INCENTIVES - PERCENT OF VENDORS OFFERING

| TYPE OF VENDOR | VOLUME | MULTIPLE | | PREPAY | BUNDLED PACKAGES |
		SITES	SYSTEMS		
Hardware	60%	20%	40%	30%	50%
Software	87%	80%	47%	7%	67%
All	76%	56%	44%	16%	60%

Note: Rows total more than 100% because of multiple types offered

Source: Exhibit II - 6

EXHIBIT II-6

3. Software discounts offered.

VENDOR	DISCOUNT TYPES					BUNDLED PACKAGES?		
	VOLUME	MULTI-SITES	MULTI-SYSTEMS	PRE-PAYMENT	OTHER	YES	NO	EXAMPLE
A	X					X		Professional productivity pkg. =sum of parts.
B								
C	X		X			X		HW and SW.
D	X	X in 3 years.	X		Hotline; updates.		X	
E			X	X			X	
F		X		X			X	
G							X	
H	X						X	
I	X	X	X	X		X		Distributed processing pkgs. - Parts available separately in other packages.
J	X		X			X		On 32 bit machines.

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3. Software discounts offered.

VENDOR	DISCOUNT TYPES					BUNDLED PACKAGES?		EXAMPLE
	VOLUME	MULTI-SITES	MULTI-SYSTEMS	PRE-PAYMENT	OTHER	YES	NO	
K	x	x	x		Education	x		3 products combined at 1/2 price
L	x	x	x		Help desk		x	
M	x						x	
N		x					x	
O	x	x				x		Separately marketed packages licensed modularly.
P		x				x		License features separately. Products x, y, z offered separately.
Q	x	x				x		Cataloguing reporting system & equipment mgmt. search.
R	x	x	x			x		
S	x	x	x			x		Main package has fixed price.
T	x	x	x			x		Systems incorporated into series price.
U	x	negot.	negot.				x	
V	x					x		3 modules not sold separately.

3. Software discounts offered.

VENDOR	DISCOUNT TYPES					BUNDLED PACKAGES?		EXAMPLE
	VOLUME	MULTI-SITES	MULTI-SYSTEMS	PRE-PAYMENT	OTHER	YES	NO	
W	X	X	X	X		X		Retail banking system.
X	X	X				X		Relational data base management system=10 modules.
Y	X						X	

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- Respondents generally agreed that value pricing was the most important criteria for software support pricing (Exhibit II-9). Hardware companies are somewhat more likely to take competition and the price of the package into account than are software companies.

- One-third of software company respondents sometimes gave discounts on software support as opposed to one-fifth of hardware company respondents (Exhibit II-11).

  - For both hardware companies and one software company this was in connection with government procurements.

  - In most cases such discounts are rare and are not related to license discounts or having a single, common customer contact point or help desk.

  - A few companies treat OEM's differently from other types of customers (Exhibit II-12).

C. SOFTWARE SUPPORT SERVICES

- Over 90% of software companies offer software warranties, compared to 60% of hardware companies. Most software companies require vendor installation for the warranty to be effective (Exhibit II-13).

  - Warranty periods vary greatly, with 90 days being the norm for hardware companies and 90 days to a year among software companies (Exhibit II-14).

  - The most common type of warranty is compliance with documentation.

- There is universal agreement among vendors that fixing programming errors and distributing new releases is part of software support (Exhibit II-15a). There is fairly wide agreement on including enhancements, adding new features and publication updates (generally more among software than hardware companies). There is much less tendancy to include:

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EXHIBIT II - 9: SOFTWARE SUPPORT PRICING CRITERIA

TYPE VENDOR	PROFITABILITY	PERCENT OF PRICE	VALUE	COMPETITION
Hardware	3.4	3.4	3.8	3.6
Software	3.4	3.0	4.1	2.9
All	3.4	3.2	4.0	3.2

1 = Low Importance

5 = High Importance

Source: Exhibit II - 10

EXHIBIT II-10

5a.   Software support pricing criteria.

VENDOR	PROFITABILITY	PERCENT	VALUE	COMPETITION	OTHER
A	3	4	5	4	
B					
C	3	2	3	2	
D	3	1	5	4	
E	2	5	4	3	
F	4	5	3	2	
G	4	3	2	5	
H					
I	5	2	3	4	
J	5	5	5	5	

5a. Software support pricing criteria.

VENDOR	PROFITABILITY	PERCENT	VALUE	COMPETITION	OTHER
K	2	4	3	5	
L	2	1	5	4	
M	4	3	5	2	
N	4	4	3	2	
O	3	4	4	3	
P	4	3	5	2	
Q	5	2	3	4	
R	3	1	5	2.5	
S	4	1	5	3	
T	3	5	3	3	
U	3	4	5	3	
V	DK	DK	DK	DK	
W	5	2	4	3	
X	4	5	3	2	
Y	2	3	5	4	

5b. Software support discounting.

VENDOR	DISCOUNTS? YES	NO	CONDITIONS	FREQUENCY	RELATED TO LIC.DISCOUNTS? YES	NO	CONTACT POINT? YES	NO
A		X						
B		X						
C	X		volume=GSA and special bids.	There is usually some discount.		X	X	
D		X						
E		X						
F		X						
G		X						
H		X						
I		X						
J	X		GSA	Rarely.		X	X	

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5b.   Software support discounting.

VENDOR	DISCOUNTS?		CONDITIONS	FREQUENCY	RELATED TO LIC.DISCOUNTS?		CONTACT POINT?	
	YES	NO			YES	NO	YES	NO
K	x		Special arrangement, army $10 mil	Rarely		x		x
L		x						
M		x						
N		x						
O		x						
P	x		Promotional efforts (2 for 1 classes)	Rarely		x	x	
Q		x						
R		x						
S	x							
T		x						
U		x						
V		Free						
W	x		1)installation support 2)pre-planning,post install. training. 3)maintenance	new products for beta test installation.		x	.	x

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5b. Software support discounting.

VENDOR	DISCOUNTS? YES	DISCOUNTS? NO	CONDITIONS	FREQUENCY	RELATED TO LIC.DISCOUNTS? YES	RELATED TO LIC.DISCOUNTS? NO	CONTACT POINT? YES	CONTACT POINT? NO
X		X						
Y	X		large systems—value to customer.			X		X

EXHIBIT 11-12

6. Differences in software support terms.

VENDOR	END USER	OEMS
A	No differences.	
B		Little difference.
C		Not applicable.
D	No differences.	
E		Not applicable.
F		Not applicable.
G		Value added.
H		Discounted SW to build something on top.
I		No support fee and supports self.
J	No differences.	

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6. Differences in software support terms.

VENDOR	END USER	OEMS
K		N/A
L		N/A
M		N/A
N		N/A
O		N/A, although we have only 1; supported like a client
P	only by size	
Q		N/A
R		N/A
S		N/A
T		Support oem and not end user. Offer control site support if incorporated into their product and oem assumes reponsibility to end user
U	no difference	no difference
V	majority of calls.	support direct to dealer with priority category, mfr. distributor, dealer.
W		Not much diff., but banks can service other banks with our product.

6. Differences in software support terms.

VENDOR	END USER	OEMS
X		Must support own product.
Y		Don't charge for support per s e -extensive support "included."

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EXHIBIT II - 13: SOFTWARE WARRANTIES

PERCENT OF COMPANIES:

TYPE VENDOR	OFFERING WARRANTIES	REQUIRING VENDOR INSTALLATION FOR WARRANTY
Hardware	60%	20%
Software	93%	73%
All	80%	52%

Source: Exhibit II - 14

7. Software warranties.

VENDOR	WARRANTED?		INSTALLATION SERVICE?		LENGTH	COVERAGE
	YES	NO	WITH	W/OUT		
A	X				90 days.	Conform to spublished specs. - correct free of charge.
B	X				90 days.	
C		X				
D		X				"Implied warranty" - we replace system.
E		X				
F		X				
G	X		X	X	perpetual.	Usability is inexplicitly guaranteed.
H	X				90 days.	
I	X		X		term of license.	bugs.
J	X			X	90 days.	Media, bugs, free from defects.

7. Software warranties.

VENDOR	WARRANTED?		INSTALLATION SERVICE?		LENGTH	COVERAGE
	YES	NO	WITH	W/OUT		
K	x		x		Infinity	Malfunctions & bugs - operate with current IBM HW & op. sys. on-site & phone support
L	x		x		3 mths. or 1 year	Defective SW
M	x		x		life of license	Complies with documentation
N	x			x	180 days	Fix any bugs - then on T & M basis
O	x				1 yr.	Complies with documentation
P	x			x	180 days	Complies with documentation
Q	x		x		1 yr.	Any SW bugs
R		x				
S	x			x		Complies with documentation
T	x		x		1 yr.	Complies with documentation/we will fix or refund
U	x		x		1 yr.	Any problem that is vendor fault
V	X				90 day	(implied warranty)

7. Software warranties.

VENDOR	WARRANTED?		INSTALLATION SERVICE?		LENGTH	COVERAGE
	YES	NO	WITH	W/OUT		
W	X			license smaller life, products.	90 days	If user changes code, warranty is void.
X	X				90 days	Normal use.
Y	X		X		90 days	Published specifications.

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EXHIBIT II - 15a;   SOFTWARE SUPPORT DEFINITIONS

DEGREE TO WHICH AN ACTIVITY IS INCLUDED*

ACTIVITY	HARDWARE VENDORS	SOFTWARE VENDORS	ALL VENDORS
Fixes to program- ming errors	5.0	4.9	4.9
Conversion to run with different hardware or software	2.4	3.7	3.3
Extending or enhancing existing features or making existing features work better	3.6	4.3	4.0
Adding new features	4.1	4.4	4.3
Distributing soft- ware fixes or new releases	5.0	5.0	5.0
Publication updates	3.4	4.7	4.2
Training	2.8	3.7	3.4
Consulting	2.9	3.1	3.0

* 5 = Always included   F   Never Included

Source: Exhibit II - 16

EXHIBIT II - 15b: SEPARATE SOFTWARE SUPPORT CHARGES

PERCENT OF COMPANIES MAKING ADDITIONAL CHARGE

ACTIVITY	HARDWARE VENDORS	SOFTWARE VENDORS	ALL VENDORS
Fixes to program-ming errors	22%	7%	13%
Conversion to run with different hardware or soft-ware	67%	53%	58%
Extending or enhanc-ing existing features or making existing features work better	33%	40%	38%
Adding new features	33%	47%	42%
Distributing soft-ware fixes or new releases	11%	7%	8%
Publication updates	33%	7%	17%
Training	89%	53%	67%
Consulting	67%	73%	71%

Source: Exhibit 16

8. Software support definitions.

VENDOR	FIXES INC	FIXES $	CONVERT INC	CONVERT $	ENHANCE INC	ENHANCE $	ADD INC	ADD $	REL. INC	REL. $	PUB. INC	PUB. $	TRAIN INC	TRAIN $	CONSULT INC	CONSULT $
A	5	N	1		4	N	2	Y	5	N	5	N	1	Y	1	
B																
C	5	Y	N/A		4	N	4	N	5	N	5	N	4	Y	4	N
D	5	Y/N	4	Y	5	Y/N	5	Y	5	Y	5	Y	5	Y	5	Y
E	5	N	2	Y	4	N	4	N	5	N	3	Y	2	Y	3	N
F	5	N	5	N	3	Y	N/A		5	N	1	N	3	Y/N	2	Y
G	5	N	1	Y	1	N	5	N	5	N	1	Y	5	Y	5	Y
H	5	N	1	N	1	N	5	N	5	N	1	N	4	Y	5	Y
I	5	N	2	Y	5	N	4	Y	5	N	5	N	–	Y	–	Y
J	5	N	5	Y	5	Y	5	N	5	N	5	N	1	Y	1	Y

EXHIBIT II-16

8. Software support definitions.

VENDOR	FIXES		CONVERT		ENHANCE		ADD		REL.		PUB.		TRAIN		CONSUL	
	INC	$	INC	$	INC	$	INC	$	INC	$	INC.	$	INC	$	INC	$
K	5	N	2	N	4	N	4	N	5	N	5	N	5	Y	5	Y
L	5	N	2	Y	3	Y	4	N	5	N	5	N	5	N	5	Y
M	5	N	5	Y/N	5	N	5	N	5	N	5	N	5	N	1	
N	5	N	2	Y	5	N	3	Y	5	Y/N	5	Y/N	3	Y	2	Y
O	5	N	5	Y	4	N	4	N	5	N	5	N	5	Y	3	Y
P	5	N	2	Y.	5	N	5	N	5	N	5	N	5	Y	3	Y
Q	5	N/Y	5		5	Y	5	Y	5	N	5	N	Charge if OS		5	Y
R	5	N	5	N	5	N	5	N	5	N	5	N	4	N	2	Y
S	5	N	5	N	5	Y	5	Y	5	N	2	N	5	N	3	Y
T	5	N	5	Y	5	N	5	N	5	N	5	N	2	Y	5	Y
U	3	N	4	N	1	N	2		5		5		4		2	.
V	5	N	5	Y	5	Y	5	Y	5	DEPEND	5	N	5	Y	1	-
W	5	N	5	Y	5	Y/N	5	Y	5	N	5	N	2	Y	1	Y
X	5	N	1	-	3	Y	5	Y	5	N	5	N	5	N	5	N
Y	5	N	3	-	4	N	5	Y/N	5	N	3	N	1	Y	3	Y/N

9. Services supplied beyond maintenance contract.

VENDOR	NONE	MODS		APPL. DESIGN	APPL. PROG.	OP. SUPPORT	OTHER
		APPL. SW.	SYS. SW.				
A	X						
B		X	X				
C		X	X				
D		X	X	X	X		
E		X	X				
F			X			X	
G		X	X	X	X	X	
H				X	X		
I		X	X	X	X	X	
J	X						

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9. Services supplied beyond maintenance contract.

VENDOR	NONE	MODS		APPL. DESIGN	APPL. PROG.	OP. SUPPORT	OTHER
		APPL. SW.	SYS. SW.				
K	x	N/A	N/A	N/A	N/A	N/A	
L		x		x	x	x	
M							
N		x		x	x	x	
O		x		x		x	
P						x	
Q		x		x	x	x	
R		x	x	x	x	x	
S		x		x	x	x	
T		no answer					
II	x						
V	x						
W		x	x	x	x	x	
X		x	x	x	x	x	
Y						x	

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10. Limits on software support provided.

VENDOR	EXPLICIT LIMITS?		EXAMPLES	HOW CUSTOMER MADE AWARE
	YES	NO		
A	X		Initial installation activities.	Contract.
B		X	As long as willing to pay.	
C		X		
D		X		
E		X		
F		X		
G		X		
H		X		
I	X		For every $700K=1 month free support.	He presumes some support.
J		X		

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INPUT

10. Limits on software support provided.

VENDOR	EXPLICIT LIMITS?		EXAMPLES	HOW CUSTOMER MADE AWARE
	YES	NO		
K		x		
L		x		
M		x		
N		x		
O	x		only in # of free mandays	contract
P		x		
Q	x			full work statement with # of hours identified – anything above is chargeable
R		x		
S		x		
T	x		when buy product get 5 days on site SE support (specific product)	salesperson
U		x		
V		x		
W	x		On free part only–30 man wks/cple days.	contract
X		x		
Y		x		

11. Levels of software support.

VENDOR	DIFF.LEVELS AT DIFF.PRICES		ON-SITE	RESP. TIME	RES. TIME	SERVICES (EXAMPLES)	OTHER (DESCRIBE)
	YES	NO					
A		X					
B	X		X				
C		X					
D	X		X	X		X	
E	X		X				
F	X					1 type service per product & different products for local and remote.	
G	X					1)Basic-hotline;dist. SW 2)Extended-same SW, high cost. 3)Negotiable-guaranteed response time.	
H		X					
I		X					
J	X		X				

11. Levels of software support.

VENDOR	DIFF.LEVELS AT DIFF. PRICES		ON-SITE	RESP. TIME	RES. TIME	SERVICES (EXAMPLES)	OTHER (DESCRIBE)
	YES	NO					
K		x					
L		x					
M		x					
N		x					
O	no answer						
P	investigating						
Q	x		x	x	x	if after first year elects not to pick up maintenance warranty contract: no more updates. Get bug go to next maintenance release – charge T & M if go on – site to install new release or fix bug.	
R		x					
S	x		x				
T		x					
U		x					
V		x					
W	x					prog.,analyst,technical	provide professional services/os differentiated.

11. Levels of software support.

VENDOR	DIFF.LEVELS AT DIFF. PRICES		ON-SITE	RESP. TIME	RES. TIME	SERVICES (EXAMPLES)	OTHER (DESCRIBE)
	YES	NO					
X		X					
Y		X					

INPUT

12. Non-chargeable on-site service.

VENDOR	NONE	EDUCATION	INITIAL INSTALLATION	OTHER
A				
B				
C				
D	X			
E			X	Large sale with major problem.
F				
G	X			
H				
I	X			
J				

INPUT

12. Non-chargeable on-site service.

VENDOR	NONE	EDUCATION	INITIAL INSTALLATION	OTHER
K				
L				
M				
N				
O				
P				
Q			x	as long as they have maintenance agreement
R				
S			x	
T				
U		x		
V	X			
W				
X				
Y				

13. Support for old releases.

VENDOR	OLD RELEASE SUPPORT			HW UNSUPPORTED	
	RELEASES	MONTHS	DISCONTINUE NOTICE	YES	NO
A			90 days		X
B	1	24	90 days	X	
C	1		6 months–1 year		X
D	0	0	1 year	X	
E		0	2 years–system SW 1 year–applic. SW	X	
F	Always supported		6 months		X
G	2		1 year.	X	
H		24	in HW contract		X
I		3 months–yrs.		X	
J		15			X

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INPUT

13. Support for old releases.

| VENDOR | OLD RELEASE SUPPORT | | | HW UNSUPPORTED | |
	RELEASES	MONTHS	DISCONTINUE NOTICE	YES	NO
K	1		6 – 12 months		
L		12	no policy		
M	separate agreement		3 months		
N	technically not at all		4 months		
O	1		3 months		
P	try to migrate in 2 years always		none		
Q	no fixed term				
R		12	6 – 9 months		
S		60	DK		
T		12	12 months		
U	1 or 2	12 – 24			
V		contract length	sales-oriented function		
W	DK				

INPUT

13. Support for old releases.

	OLD RELEASE SUPPORT				HW UNSUPPORTED	
VENDOR	RELEASES	MONTHS		DISCONTINUE NOTICE	YES	NO
X	Unlimited					
Y	Forever					X

INPUT

- Forty percent of hardware vendors do not provide software support on some of their hardware models.

D. BUSINESS ISSUES

- About half of respondents are involved in OEM software licensing as licensees (Exhibit II-23). About the same number are involved as licensors (Exhibit II-24). Most respondents would not provide details on royalty arrangements; the numbers supplied varied from 10% with support to 55% without support (in an unusual arrangement).

- The organization of the software support function tends to be by geography or product type (Exhibit II-25). Hardware companies are somewhat more likely to combine more than one organizing principle.

- Software cross-training is common among both software companies (60%) and hardware companies (70%): There are no pronounced trends in this area (Exhibit II-26).

E. CUSTOMER COMMUNICATION

- All companies use a mechanism for tracking software problems and resolutions (Exhibit II-27). About two-thirds of these systems are automated; there are few differences by product type.

- Fifty percent of hardware companies and 60% of software companies report that 95% or more of reported problems are resolved (Exhibit II-28). In half the cases a determination of resolution is made by the customer. All of the reporting hardware companies and 80% of software companies have these resolution figures audited, although not all auditing is necessarily rigorous.

- Similarly, all responding companies classify problems by severity (Exhibit II-29).

INPUT

14. Software reselling. (LICENSEE)

VENDOR	YES	NO	SUPPORT BY		ROYALTY PERCENT		POST-TERMINATION SUPPORT ARRANGEMENTS
			RESP.	LICENSOR	WITHOUT SUPPORT	WITH SUPPORT	
A	X		X			15-30	No support
B		X					
C	X	X	X				Confidential.
D		X					
E	X			X		40-55	Grandfather clause.
F		X					
G	X			X			No support.
H		X					
I	X						
J							

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INPUT

14. Software reselling. (LICENSEE)

VENDOR	YES	NO	SUPPORT BY		ROYALTY PERCENT		POST-TERMINATION SUPPORT ARRANGEMENTS
			RESP.	LICENSOR	WITHOUT SUPPORT	WITH SUPPORT	
K		x					
L	x		x		10 – 15%		N/A because they lose right to use product
M	foreign agents x	x	x		Confidential		
N		x					
O	x						
P	x						
Q		x					
R		x					
S		x					
T							
U	X **	x					
V							
W							

**only if sub-license imbedded in our product.

14. Software reselling. (LICENSEE)

VENDOR			SUPPORT BY		ROYALTY PERCENT		POST-TERMINATION SUPPORT ARRANGEMENTS
	YES	NO	RESP.	LICENSOR	WITHOUT SUPPORT	WITH SUPPORT	
X				X			X
Y	X						Y

14. Software reselling. (LICENSOR)

VENDOR	SUPPORT BY				ROYALTY PERCENT		POST-TERMINATION SUPPORT ARRANGEMENTS
	YES	NO	RESP.	LICENSEE	WITHOUT SUPPORT	WITH SUPPORT	
A		X					
B	X						
C		X					
D	X						
E	X			X		50-70	
F							
G							
H	X						
I				Modified SW.			
J							

14. Software reselling. (LICENSOR)

VENDOR	SUPPORT BY				ROYALTY PERCENT		POST-TERMINATION SUPPORT ARRANGEMENTS
	YES	NO	RESP.	LICENSEE	WITHOUT SUPPORT	WITH SUPPORT	
K		X					
L							
M							
N							
O	x				10 – 50	10 – 50	None
P	x						
Q							
R							
S	x						
T						10 – 15	None
U				x			
V							
W	x						performance bonds/contract
X	x						
Y	x						guarantee or withdraw.

EXHIBIT II-25

15a. Support function organization.

VENDOR	GEOGRAPHIC	PRODUCT TYPE	COMPLEXITY	COMBINATION
		RELATIVE SPECIALIZATION BY:		
A	By product line			
B				
C	X			
D		X		
E		X		
F				Regional specialists, local FSE.
G	X			
H				Generalists and specialists;4expert grps. central. functions; 2 development groups.
I				Market segment;region Home office.
J	Centralized specialists.			

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INPUT

15a. Support function organization.

VENDOR	RELATIVE SPECIALIZATION BY:			
	GEOGRAPHIC	PRODUCT TYPE	COMPLEXITY	COMBINATION
K	Y - divided into tech & mnt supp.			
L				
M			Developers, technical "heavy weights"	
N		Y - by family of products		
O		nationwide		
P	x	x		
Q		x		
R				Field, Regional, R & D
S				x
T		Y - by complexity - tutorial end user function		
U	from pre-install to up and running			
V	series of products			
W		within industry		
X	regional svc centr		technical services	Marketing Tech Rep
Y				Home Office, salt& pepper

15b. Support cross-training and teams.

| | HARDWARE/SOFTWARE | | | | | |
VENDOR	SOFTWARE	GENERAL	TRENDS	CROSS-TRAINING	TEAMS	TRENDS
A	some	some	network & telecomms. do not cross well.	minimal	moving toward	
B						
C	Much	much	less	much	infrequent	
D	None	little		keep separate	only if the problem is not isolated.	
E	Little		DK	minimal	For sys. SW	Slowly toward.
F	Common at lower levels.	Much	More on lower end.	throughout organization.	Always	Report to same Manager.
G	Some	Some	Some	None	Closely	Closely
H	Much	Much			Yes	Mktg-support
I	50%	25%			Yes	More
J	More	Much		Yes		Our charter.

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15b. Support cross-training and teams.

| | HARDWARE/SOFTWARE | | | | | |
VENDOR	SOFTWARE	GENERAL	TRENDS	CROSS-TRAINING	TEAMS	TRENDS
K		Some	Problem-initial install. has generalists, then they are specialists.			
L	Much					
M	Much	Much				
N		Much				
O	this staff	Some	Within product line-must know interfaces.			
P	Much	Much				
Q	Much	Much	Do not depend on 1 person			
R	Some	Some	NY-larger products & more prod. specialists.			
S	Within applic	Within appli				
T	Much	Much	Depth in any area.			
U	None	Little				
V	Little	Much				
W	within prod.	Not enough.	None, across lines.			

15b. Support cross-training and teams.

VENDOR	SOFTWARE	GENERAL	TRENDS	HARDWARE/SOFTWARE		
				CROSS-TRAINING	TEAMS	TRENDS
X	Much	Much	Technology by technology.			
Y	Little	Little	Lots of misinformation, little knowledge transfer.			

EXHIBIT II-27

16. Software problem tracking.

VENDOR	TRACKING MECHANISM?		DESCRIPTION	DIFFERENCES BY PRODUCT TYPE
	YES	NO		
A	X		Automated—available to field office and development organization.	None
B	X			Yes
C	X		Problem Reports thru HQ functions.	None
D	X		Database—user fills out sheet, then field office allocates problem.	None
E	X		On-line DB accessible by all client with support.	None
F	X		On-line —all levels of hierarchy.	None
G	X		Automated log.	Large systems have bigger data base. Micros do not have one yet.
H	X		Remote access by customer. Early warning system.	Separate by product.
I	X		Automated.	HW and SW; HW less automated.
J	X			None.

16. Software problem tracking.

| VENDOR | TRACKING MECHANISM? | | DESCRIPTION | DIFFERENCES BY PRODUCT TYPE |
	YES	NO		
K	x		Automated - call product support staff	Sorted by product
L	x		Computerized tracking at head office - constant reporting	None
M	x		On-line reporting sys.-data base of all calls. Abstract problems & send to users to add to data base	Yes
N	x		SW investigation request system	None
O	x		Automated logging	None
P	x		50% automated - Internal:client services org. tracks & logs quality & timeliness	None
Q	x			None
R	x		Worldwide - computerized logging	None
S	x		Customer fills out form - configuration and control board	None
T	x		Logged & documented - escalation procedure	None
U	x		Computerized tech support information system and newsletter	None
V			automated-determine whether SW, design or documentation	None

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16. Software problem tracking.

VENDOR	TRACKING MECHANISM?		DESCRIPTION	DIFFERENCES BY PRODUCT TYPE
	YES	NO		
W	X		Automated-looking for new one.	Maintained from development location.
X	X		On-line worldwide system	
Y	X		SW tracking report	Yes.

16a. Problem resolution.

VENDOR	PERCENT RESOLVED	WHO DETERMINES		AUDITED		METHOD
		VENDOR	CUSTOMER	YES	NO	
A	100	X		X		
B	100	X		X		
C	100		X	X		Management review.
D	95		X	X		Plotting time.
E	66	X	X	X		Statistical number of submittals.
F	97		X	X		Sampling/survey.
G	90	X	X	X		
H	35	X		X		
I	98	X	X	X		Customer service organization.
J	Confidential					

INPUT

16a. Problem resolution.

VENDOR	PERCENT RESOLVED	WHO DETERMINES		AUDITED		METHOD
		VENDOR	CUSTOMER	YES	NO	
K	100		x	x		
L	75	x		x		
M	100		x	x		
N	80	x			x	
O	100	x	x	x		Over coffee
P	90	x	x	x		Line of activity, survey customers
Q	100		x	x		Log
R	+95		x	x		Reviewed weekly
S	90		x	x	x	
T	100	x		x		Annual customer survey
U	92.5	x			x	
V	99			x		weekly management review.

16a. Problem resolution.

| VENDOR | PERCENT RESOLVED | WHO DETERMINES | | AUDITED | | METHOD |
		VENDOR	CUSTOMER	YES	NO	
W	100	X	X	X		data base analysis,
X	99			X		senior support managment.
Y	75	X		X		

17a. Problem classification by severity.

VENDOR	CLASSIFIED?		CUSTOMER		VENDOR		OTHER
	YES	NO	GEN'L	SPECIFIC	HOTLINE	SPECIFIC SUPPORT	
A	X				X		Varies by product.
B	X						
C	X					X	
D	X					X	
E	X		X			X	we establish final severity. Consider customer's plight.
F	X		X				
G	X			X		X	
H	X					X	
I	X				X		
J	X			X		X	

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INPUT

17a. Problem classification by severity.

VENDOR	CLASSIFIED?		CUSTOMER		VENDOR		OTHER
	YES	NO	GEN'L	SPECIFIC	HOTLINE	SPECIFIC SUPPORT	
K	x			x			
L	x					x	
M	x			x			
N	x					x	'
O	x						
P	x					x	
Q	x			x		x	If customer thinks he has a "hard down"
R	x					x	
S	x			x		x	
T	x					x	
U	Decline						
V	x						

17a. Problem classification by severity.

| VENDOR | CLASSIFIED? | | CUSTOMER | | VENDOR | | OTHER |
	YES	NO	GEN'L	SPECIFIC	HOTLINE	SPECIFIC SUPPORT	
X	X					X	
Y	X			X		X	

INPUT

- In hardware companies, half use customer determinations, while all responding companies use their own determinations as well, generally from a specific member of their support staff.

- Only one-third of software companies use customer determinations; almost two-thirds use their own staff's determinations.

- Two-thirds of software companies have arrangements for customers to call 168 hours a week, as opposed to 30% of hardware companies (on software issues) as shown in Exhibit II-30. Forty percent of companies use 800 numbers.

- For respondents who were able to quantify the relative use of different methods their customers use to communicate problems to them, there are significant differences between hardware and software vendors (Exhibit II-31). Ignoring methods used by 10% or fewer of customers,

  - Hardware vendor customers are fairly evenly split between the use of letter, EMS and telephone.

  - The telephone is far and away the most important mechanism used by software vendor customers. However, almost half of reporting software vendors see an increase in electronic means of communication.

- In responding to customer problems, the telephone is the most important means of communication, especialy for software companies (Exhibit II-33). On-site calls are, somewhat surprisingly, the next most important. Many problems are responded to in newsletters or releases.

- Mail and on-site visits are by far the most common means of vendor communication to customers regarding other types of service (Exhibit II-35).

  - While hardware vendors are more likely to rely on the mail than are software vendors for installation, the opposite is true for product fixes.

INPUT

EXHIBIT II-30

17b&c. Customer telephoning.

| VENDOR | HOURS/WEEK ABLE TO CALL | | | USE OF 800 NUMBERS | | |
	VENDOR	ANS. SVC.	VARIANCES BY PRODUCT/CUSTOMER	NONE	ONE	MULTI-WHY?
A	56		1 product - 84 hours.			product & regional support centers.
B	84		None			product scope & area.
C	140		None		X	
D	63-SW		None			
E	60	168	None		X	
F			Varies --ome have zero activity.		X	
G	168		None			different hot lines.
H	168-crit. 40-noncrl			X		
I	168		Yes			product lines.
J	40		None		X	

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INPUT

EXHIBIT II-30

17b&c. Customer telephoning.

VENDOR	HOURS/WEEK ABLE TO CALL			USE OF 800 NUMBERS		
	VENDOR	ANS. SVC.	VARIANCES BY PRODUCT/CUSTOMER	NONE	ONE	MULTI-WHY?
K	168			x		
L	168		Can buy different services		x	
M	168		None		x	
N	40		None	x		
O	168	night		x		
P	* 84		Direct Hot line – 24 hours a day	x		
Q	168		None	x		
R	168	initial call	None		x	
S	84		None	x		
T	168		None	x		
U	168		None		x	
V	52.5		None			certain prod.&Cust.

EXHIBIT II-30

17b&c. Customer telephoning.

	HOURS/WEEK ABLE TO CALL			USE OF 800 NUMBERS		
VENDOR	VENDOR	ANS. SVC.	VARIANCES BY PRODUCT/CUSTOMER	NONE	ONE	MULTI-WHY?
W	144		DK		X	
X	168				X	
Y	168		None	X		

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INPUT

EXHIBIT II - 31:   METHODS OF PROBLEM COMMUNICATION

PERCENT OF VENDORS' CUSTOMERS USING A METHOD
MORE THAN 10% OF THE TIME

VENDOR TYPE	LETTER	EMS	TELEPHONE	IN PERSON
Hardware (N = 8)	38%	38%	38%	25%
Software (N = 13)	8%	8%	100%	31%
All (N = 21)	19%	19%	76%	29%

Note: Rows may total more than 100% because of multiple methods

Source: Exhibit II - 32

INPUT

18. Methods of problem communication.

VENDOR	LETTER	EMS	TELEPHONE	IN PERSON	CHANGES
A	99	1			
B					
C	1	99			
D	25	0	50	25	Customer data base.
E	30	60	10	0	Elecgronic mail.
F		1	10	90	
G		0	99		
H	0	0	90	10	Yes—but DK yet.
I		100			
J	X		X		

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INPUT

EXHIBIT II-32

18. Methods of problem communication.

VENDOR	LETTER.	EMS	TELEPHONE	IN PERSON	CHANGES
K	10	0	90	0	Computer to computer links
L	1	0	99	0	No
M	5	0	75	20	Face to face will diminish – electronic mail will increase – customer access to data base.
N	0	0	60	40	None
O	5	0	95	0	On-line, eventually
P	3	7	90	0	Higher level of electronic mail or communi-cations
Q	0	0	100	0	None
R	10	0	90	0	Direct dialing to on-line history – file
S	x	x	x	0	
T	10	0	90	0	More telephone
U	0	0	100	0	None
V	30	0	70	0	depends on support policies

EXHIBIT II-32

18. Methods of problem communication.

VENDOR	LETTER	EMS	TELEPHONE	IN PERSON	CHANGES
W		x	x		
X			80	20	
Y	5	25	50	20	increase in electronic mail.

EXHIBIT II - 33: METHODS OF RESPONDING TO CUSTOMER

PERCENT OF VENDORS USING A METHOD

MORE THAN 10% OF THE TIME

VENDOR TYPE	LETTER	EMS	TELEPHONE	ON-SITE	NEWSLETTER	RELEASE
Hardware (N = 8)	13%	13%	63%	38%	13%	25%
Software (N = 14)	21%	21%	100%	43%	21%	36%
All (N = 22)	18%	18%	86%	41%	18%	32%

Note: Rows may total more than 100% becuase of multiple methods

Source: Exhibit II - 34

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INPUT

19. Methods of responding to customers (percent).

VENDOR	ON-SITE	TELEPHONE	LETTER	NEWSLETTER	RELEASE	EMS
A	3	95	0	N/A		0
B		Most				
C	7	85	1.5	DK	5	0
D	26	65	100	10	50	0
E	1	5	5	100	70	100
F	81	10	0	0	0	0
G	-20	99	2			5
H	100					
I	*					
J	*					

*depends on severity

INPUT

19. Methods of responding to customers (percent).

VENDOR	ON-SITE	TELEPHONE	LETTER	NEWSLETTER	RELEASE	EMS
K	1%	95%	5%	0		0
L	50	20	5	20	60	10
M	20	75	10	0	10	0
N	30	60	10	0	50	0
O	5	100	100	100	100	0
P	25	100	10	100	75	17.5
Q	0	100	0	0	0	0
R	5	95	5	0	15	0
S	10	50	30	10	10	10
T	0	85	10	0	5	0
U	20	75	5	0	0	0

19. Methods of responding to customers (percent).

VENDOR	ON-SITE	TELEPHONE	LETTER	NEWSLETTER	RELEASE	EMS
V	0	80	15		5	100
W	DK	DK	DK	DK	DK	DK
X	15	75				5
Y		20				100(online)

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INPUT

EXHIBIT II - 35: METHODS OF VENDOR COMMUNICATION TO CUSTOMER

TYPE OF SERVICE/INFORMATION: PERCENT OF VENDORS UTILIZING

MEANS OF COMMUNICATION	ORIGINAL MANUAL	MANUAL UPDATES	INSTALLATION	PRODUCT FIXES	PRODUCT UPDATES	PRODUCT USAGE TECHNIQUES
Mail						
Hardware Vendors	70%	100%	50%	30%	60%	60%
Software Vendors	60%	80%	7%	60%	67%	53%
All Vendors	64%	88%	24%	48%	64%	56%
On-Site						
Hardware Vendors	40%	0%	70%	50%	20%	30%
Software Vendors	33%	7%	87%	33%	33%	47%
All Vendors	36%	4%	80%	40%	28%	40%
Other						
Hardware Vendors	10%	10%	0%	40%	20%	10%
Software Vendors	7%	7%	0%	27%	20%	27%
All Vendors	8%	8%	0%	32%	20%	20%

Source: Exhibit II - 36

INPUT

- Product fixes have the most diverse types of communications being used.

- Very few respondents were able to provide an estimate of their annual communication costs (Exhibit II-37).

F. TRENDS

- The main trends seen were the intertwined issues of greater use of technology, greater user self-reliance and less on-site vendor intervention (Exhibit II-38). Over half of respondents see a trend toward more electronic, and less human, communications.

INPUT

20. Methods of vendor communications to customers.

VENDOR	ORIGINAL MANUAL		UPDATES		INSTALLATION		FIXES		UPDATES		USAGE TECH.	
	MEANS*	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR
A	M/OS		M	2	M/OS		OS				OS	
B	M		M									
C	OS		M	reqst	OS		OS/P				M	6
D	M		M		M		M		M		OS	
E	M	2	M	2	M	2	M	2	M	2	M	2
F	M		M	1-6	M/OS		OS		M	6-10	M	2years
G	OS		M	2	M/OS		OS		OS		M	
H	M		M		OS		OS		M/OS		P/OS	
I	OS		M		OS		P/M/EM		P/M/EM		M	
J	UPS/M		UPS/M		OS		EM/P		M		M	

*Abbreviations: M=Mail; OS=On-site; P=Phone; EM=Electronic Mail; OL=On-line; PDS=Private Delivery Service; UPS=United Parcel Service

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INPUT

EXHIBIT II-36

20. Methods of vendor communications to customers.

VENDOR	ORIGINAL MANUAL		UPDATES		INSTALLATION		FIXES		UPDATES		USAGE TECH.	
	MEANS*	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR
K	M		O S		O S		P		M		OS/P	
L	M	1	M		O S		O S	1	O S	1	M	12
M	M		M		O S		M		M.		OS	
N	O S		M	1.5	O S		M		M	1	OS	
O	M	1	M		M/ O S		M/O S		M/O S	12 – 18 mth	M/P/OS	
P	M		M		O S		M		M		M	
Q	O S		M	6	O S		M/O S		M-enhancement O S – new functionality		M	
R	O S		M		O.S		M	12	M	1	OS	
S	OS/M		M		O S		M		M		M	
T	M	1	M	1	O S		PDS		PDS		M	4
U	M		M	as needed	OS	as needed	OS		O S		M	

*Abbreviations: M=Mail; OS=On-site; P=Phone; EM=Electronic Mail; OL=On-line; PDS=Private Delivery Service;
UPS=United Parcel Service

20. Methods of vendor communications to customers.

VENDOR	ORIGINAL MANUAL		UPDATES		INSTALLATION		FIXES		UPDATES		USAGE TECH.	
	MEANS*	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR	MEANS	#/YR
V	N/A		N/A		N/A		P		P			
W	M/OL		M/OL		M/OS		M/OS/OL		M/OS/OL		OS/News letter, workshp	
X	OS		M		OS		M		M		M/OS	
Y	OS		OS		OS		download		download		N/A	

*Abbreviations: M=Mail; OS=On-site; P=Phone; EM=Electronic Mail; OL=On-line; PDS=Private Delivery Service; UPS=United Parcel Service

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INPUT

EXHIBIT II-37

21.   Software support communications costs.

VENDOR	ANNUAL COMMUNICATION COSTS
A	At least $100Mil
B	
C	DK
D	"a lot"
E	$100Mil
F	DK
G	DK
H	10% of revenue
I	DK
J	DK

INPUT

EXHIBIT II-37

21. Software support communications costs.

VENDOR	ANNUAL COMMUNICATION COSTS
K	A Lot
L	DK
M	DK
N	DK
O	DK
P	$2 - 3 Mill (guesstimate)
Q	DK
R	DK
S	Not asked
T	A lot (nondisclosable)
U	DK
V	DK
W	DK
X	Confidential.
Y	DK

EXHIBIT II-38

22. Trends and changes in software support.

VENDOR	COMMENTS
A	Greater customer self sufficiency. Less on-site, more remote diagnostics.
B	Customer concentrate more on solving businewss problems. More 4GL. Increase in design services—more education.
C	Centralized tracking and as little on-site as possible.
D	Artificial intelligence - remote monitoring - less field engineering reliance.
E	On-line telephone consulting on usage rather than bug fixes.
F	Less on-site support, more self-installation, more remote fixes.
G	Lower priced system SW. HW users will pay more for application SW if it really supplies a solution. More distributed DP. Quality will take needed boost.
H	Higher quality SW in initial releases and fixes. More technology; centralization, customer self-sufficiency; unbundle support services.
I	Distribution-absolute code vs. symbolic code. Independent SW suppliers.
J	Creative use of technology.

INPUT

EXHIBIT II-38

22. Trends and changes in software support.

VENDOR	COMMENTS
K	Remote diagnostics, better reputation.
L	Electronic communications, remote fixes and automatic fixes.
M	Moving toward retail – impact of micros – away from on-site education. More concise documentation. Sys. SW – common set of products from one product line. Unit cost of SW will come down – Avoid different command syntaxes.
N	MF systems reaching out to intelligent terminals and micros. Help screens and documentation will be within the computer. MF/SW architecture becoming more flexible.
O	Cost of support will rise as proportion of product offering. Artificial intelligence. Canned education (Deltak)
P	Remote diagnostics – move away from F E requirements. Competitors will differentiate products by level of support and quality of service.
Q	Self installable systems. Better documentation embedded in SW package. Bypassable tutorials and help menus. Could affect pricing algorithm.
R	Service and support will increase in importance.
S	We address smaller market now.
T	Customer more self reliant; more useable products; throw away software. Buy release for lower initial price then must buy next release.
U	More on-site Field Engineering support and specialized Field Engineering training.

22. Trends and changes in software support.

VENDOR	COMMENTS
V	Sensitive to user needs. They will need less assistance—user friendly products.
W	Computer to computer communications—dialup—release, troubleshooting.
X	Rising cost of service and support - 12-15%. Concentrate on finding new ways to charge for support. Use IBM as model.
Y	SW supportability agents. 100% electronic downline load response.